भारतीय मानक
Indian Standard

IS 1210 : 2020

तार और बिटुमिनी सामग्री की परीक्षण विधियाँ — फ्लोट परीक्षण

(दूसरा पुनरीक्षण)

Methods for Testing Tar and Bituminous Materials — Float Test

(Second Revision)

ICS 75.140

भारतीय मानक ब्यूरो
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FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Bitumen, Tar and Related Products Sectional Committee, PCD 06 had been approved by the Petroleum, Coal and Related Product Division Council.

This standard was originally published in 1958 as 'Methods for testing tar and bituminous materials — Float test' and subsequently revised in 1978. 'Methods for testing tar and bituminous materials' was originally published as series of 22 standards in the form of a booklet, as listed below:

IS No.	*Title*
1201 : 2004	Sampling
1202 : 1978	Determination of specific gravity
1203 : 1978	Determination of penetration
1204 : 1978	Determination of residue of specified penetration
IS 1205 : 1978	Determination of softening point
1206 (Part 1) : 1978	Determination of viscosity: Part 1 Industrial viscosity
1206 (Part 2) : 1978	Determination of viscosity: Part 2 Absolute viscosity
1206 (Part 3) : 1978	Determination of viscosity: Part 3 Kinematic viscosity
1207 : 1978	Determination of equiviscous temperature (EVT)
1208 : 1978	Determination of ductility
1209 : 1978	Determination of flash point and fire point
1210 : 1978	Float test
1211 : 1978	Determination of water content dean and stark method
1212 : 1978	Determination of loss on heating
1213 : 1978	Distillation test
1214 : 1978	Determination of matter insoluble in benzene (*WITHDRAWN* due to toxic nature of benzene)
1215 : 1978	Determination of matter insoluble in toluene
1216 : 1978	Determination of solubility in carbon disulphide trichloroethylene
1217 : 1978	Determination of mineral matter ash
1218 : 1978	Determination of phenols
1219 : 1978	Determination of naphthalene
1220 : 1978	Determination of volatile matter content

The Committee responsible for the formulation of standards in the field of bitumen, tar and related products has decided to publish these standards separately to make them user friendly.

Accordingly, second revision of this standard has been taken up to publish it as individual standard on float test and to replace mercury thermometers with suitable temperature measurement device, calibrated with appropriate accuracy, precision and sensitivity (**2.3**).

India is a signatory body of the Minamata Convention on Mercury, and based on this convention, use of mercury will be phased out by 2025. Thus, the replacement of mercury thermometers with a suitable device is necessary in order to comply with the obligations of the convention to protect human health and the environment from the adverse effects of mercury.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

Indian Standard

METHODS FOR TESTING TAR AND BITUMINOUS MATERIALS — FLOAT TEST

(Second Revision)

1 SCOPE

This standard prescribes the float test for tar and bituminous materials.

2 APPARATUS

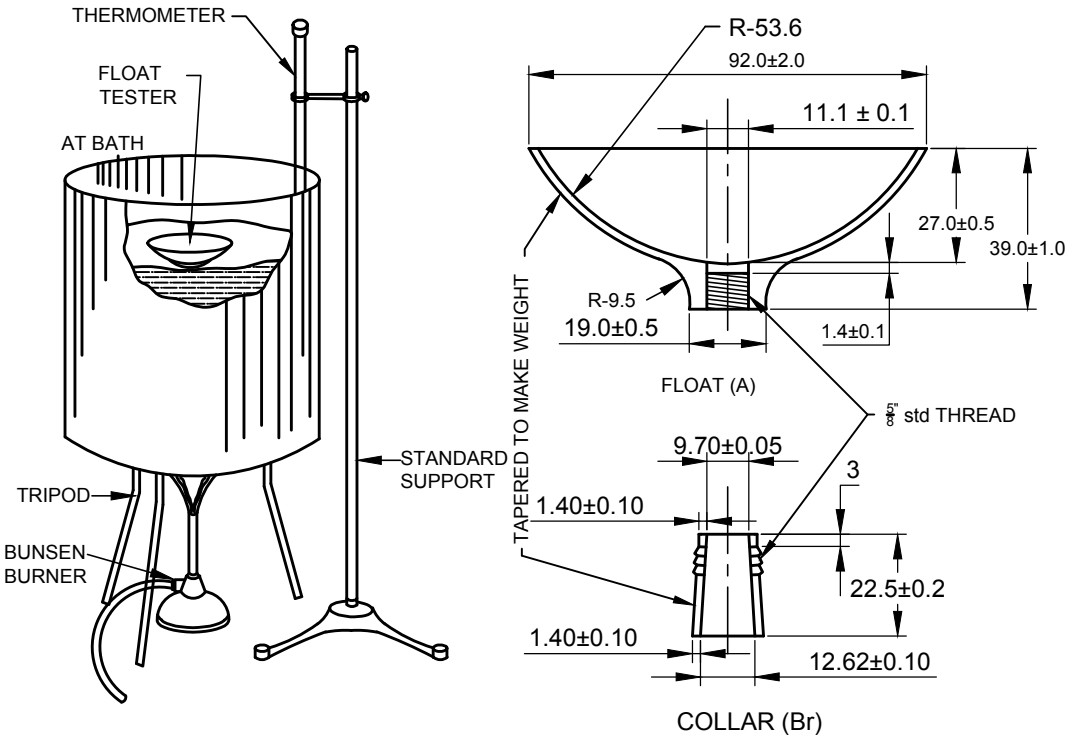
2.1 Float — Made of aluminum or aluminum alloy and conforming to Fig. 1 and the requirements given in Table 1.

2.2 Collar — Made of brass and conforming to Fig. 1 and the requirements given in Table 2.

Table 1 Float Requirements

(*Clause* 2.1)

Sl No.	Characteristic	Requirements		
		Min	*Normal*	*Max*
(1)	(2)	(3)	(4)	(5)
i)	Weight of float, g	37.7	37.90	38.10
ii)	Total height of float, mm	34.0	35.0	36.0
iii)	Height of rim above lower side of shoulder, mm	26.5	27.0	27.5
iv)	Thickness of shoulder, mm	1.3	1.4	1.5
v)	Diameter of opening, mm	11.0	11.1	11.2



WEIGHT OF FLOAT, 37.90 ± 0.20 g
WEIGHT OF COLLAR, 9.80 ± 0.20 g

ASSEMBLY OF APPARATUS
All dimensions in millimetres.

FIG. 1 FLOAT TEST APPARATUS

Table 2 Collar Requirements

(*Clause* 2.2)

Sl No.	Characteristic	Requirements		
		Min	*Normal*	*Max*
(1)	(2)	(3)	(4)	(5)
i)	Weight of collar, g	9.60	9.80	10.00
ii)	Overall height of collar, mm	22.3	22.5	22.7
iii)	Inside diameter of bottom, mm	12.72	12.82	12.92
iv)	Inside diameter at top, mm	9.65	9.70	9.75

2.2.1 The top of the collar shall screw up tightly against lower side of the shoulder.

2.3 Thermometer — Temperature measuring device as specified in either **2.3.1** or **2.3.2**.

2.3.1 *Digital Electronic Thermometer* — Confirming to the requirements given in Table 3.

Table 3 Requirements for Digital Electronic Thermometer

(*Clause* 2.3.1)

Sl No.	Characteristics	Requirements
(1)	(2)	(3)
i)	Temperature Range, °C	2 to 80
ii)	Accuracy, °C	0.1
iii)	Thermal response time, s	4 ± 2
iv)	Immersion depth, mm, *Min*	375
v)	Display resolution, °C	0.1

2.3.2 *Liquid–in–Glass Thermometers* ― Conforming with the following requirements:

Liquid	Any low hazard precision liquid
Filling above liquid	Nitrogen gas
Temperature range	2 to 80°C
Subdivisions	0.2°C
Longer graduation lines at each	1°C
Graduations numbered at each multiple of	2°C
Immersion, mm	Total
Total length	378 to 384 mm
Bulb length	9 to l4 mm
Bulb diameter	Not larger than stem diameter
Stem diameter	6.0 to 7.0 mm
Distance of bottom of bulb to graduation line at 0°C	75 to 90 mm
Distance of top of thermometer to graduation line at 80°C	30 to 45 mm
Expansion chamber to permit heating to at least	130°C
Top finish	Glass ring
Scale error at any point not to exceed	0.1°C

2.4 Bath — A water bath at least 185 mm in internal diameter and containing water at least 185 mm in depth. The height of the container above the surface of the water shall be at least 100 mm.

2.5 Calibration of Assembly — The assembly of the apparatus and dimensions additional to those given above are illustrated in Fig. 1. The assembled float and collar, with the collar filled flush with the bottom and weighed to a total weight of 53.2 g, shall float upon water with the rim 8.5 ± 1.5 mm above the surface of water.

3 PROCEDURE

3.1 Preparation of Sample

Place the brass collar with the smaller end on a brass plate which has been previously coated with equal parts of glycerine and dextrine. Melt completely a suitable quantity of residue from cutback bitumen [*see* **4.2.3.3** of IS 1213 : 2020 ‘Methods for testing tar and bituminous materials — Distillation test (*second revision*), or the material itself for solid bitumen at the lowest possible temperature to bring it to a sufficiently fluid condition for pouring. Stir thoroughly until it is homogeneous and free from air bubbles and then pour it into the collar in any convenient manner until slightly more than level with the top.

3.1.1 *Asphalt and Asphalt Products*

Cool the material to room temperature for 15 min, place in water maintained at 5°C for 5 min, and trim the material flush with the top of the collar by means of a spatula or steel knife which has been slightly heated. Place the collar and plate in the water bath maintained at 5 ± 1°C and leave them in this bath for 15 to 30 min.

3.1.2 *Tar Products*

Immediately immerse tar products for 5 min in the water bath at 5°C and trim the material flush with the top of the collar by means of a spatula or steel knife which has been slightly heated. Place the plate and collar in the water bath at 5°C and leave them in this bath for 15 to 30 min.

3.2 Heat the water bath to the temperature at which the test is to be made. Maintain this temperature accurately without stirring and the temperature shall at no time throughout the test be allowed to vary by more than

0.5°C from the temperature specified. Determine the temperature by immersing the thermometer at a depth of 40 ± 2 mm below the water surface.

3.3 After the material to be tested has been kept in the ice water at 5 percent for 15 to 30 min, remove the collar with its contents from the plate, screw into the aluminium float and immerse in water at 5 percent for one minute. Remove the water, if any, from the inside of the float and immediately float the latter in the warm bath, making sure that the collar fits tightly into the float and there is no water seepage of between the collar and float during the test.

4 REPORT

Determine, by means of a stop watch, the time in seconds between placing the apparatus on the water and when the water breaks through the material. The mean of time taken in duplicate determination shall be reported.

5 PRECAUTIONS

Precautions shall be taken to ensure that the collar fits tightly into the float and to see that there is no seepage of water between the collar and float during the test.

Bureau of Indian Standards

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: PCD 06 (14116).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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